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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : **B01D 46/02**	**A1**	(11) International Publication Number: **WO 96/24430** (43) International Publication Date: 15 August 1996 (15.08.96)

(21) International Application Number: PCT/SE96/00160

(22) International Filing Date: 8 February 1996 (08.02.96)

(30) Priority Data:
9500470-1 9 February 1995 (09.02.95) SE

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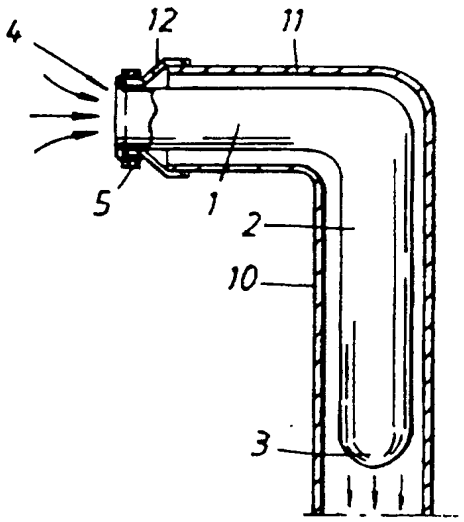
(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published
With international search report.
In English translation (filed in Swedish).

(54) Title: BAG-TYPE FILTER DEVICE

(57) Abstract

The invention relates to a filter device of tubular bag type for mounting in short inlet pipe sockets (11) to ventilation ducts (10). In order to obtain a filter with a sufficiently effective length this is, according to the invention, comprised of an inlet part (1) of the same length as the pipe socket (11) and at least one laterally bowed, elongated outlet part (2) with a closed end (3) extending a distance within the ventilation duct (10).



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Bag-type Filter Device.

The present invention relates to a bag-type filter device for mounting in short inlet pipe sockets to ventilation ducts.

A filter device of this type has its limitations consisting in the facts that either the length of the filter device is restricted to the length of the pipe socket or the length of the pipe socket has to be increased such that a filter device of requisite length can be mounted in the pipe socket. A solution of the problem usually consists in a replacement of the pipe socket or a part of it by a box containing a filter device taking up a great deal of space, for instance a box containing a number of parallel bag-type filters. If there is no space for a lengthening of the pipe socket or a lateral enlargement of this by arranging a filter box, there is in broad outline only one solution left of the problem to achieve the necessary filter action, viz. arranging openings in the side walls of the ventilation ducts and the openings closing, detachable, tightly fitting doors, through which openings bag filters provided with sleeves are laterally insertable to be mounted firmly by the sleeves to retainer means attached to the inside walls of the ducts after which the doors together with sealing means have to be mounted as shown e.g. in the SE 8200764-2.

All the solutions are unpractical or cumbersome. The object of the invention is to achieve a solution of the mentioned problem in which the above mentioned drawbacks are eliminated.

This is achievedaccording to the invention in that an open ended inlet part of the bag-type filter device is provided with a device for sealingly attaching a portion of said openended inlet part of the filter device to the wall of said pipe socket and has an extension corresponding to the length of said pipe socket and is shaped with an extension in the shape of at least one laterally curved, elongated outlet part with a closed end. In this way it is possible to position a portion or preferably the major portion of the filter device to the ventilation ducts where it always is plenty of space for filters, but where it up to now, has been difficult to place filter devices. To insert a profiled filter through a pipe

socket and fasten the open end of the filter to the opening of the pipe socket, however, is very easy. The fastening can be performed to a reducing socket at the opening of the pipe socket or directly to the end of the pipe socket by stretching and folding the open end portion of the filter around the edges of the pipe socket and locking in a suitable way, e.g. by a mounting belt.

The invention is described more in detail in the following with reference to the attached drawing, schematically showing some embodiments of filter devices according to the invention showing in Figure 1 a perspective view of a filter device according to a first embodiment, Figure 2 is a plan view of the filter in a ventilation duct shown in longitudinal section, Figure 3 is a perspective view of the filter device according to another embodiment, Figure 4 is a plan view of the filter in Fig.3 in a ventilation duct shown in longitudinal section, and Figure 5 is a perspective view of a filter device according to a third embodiment.

The embodiment of the filter device shown in Fig.1 is made of a comparatively thick-walled filter material and is shaped like an L with a tubular inlet part 1 changing to a lateral outlet part 2 and with a closed end part 3 of filter material.

As shown in Fig.2 the filter device is intended for insertion into the ventilation duct 10 having an end portion provided with a short pipe socket 11. The diameter of the filter device 1,2,3 is a bit less than the diameter of the ventilation duct 10 and the pipe socket 11, and the open end part 4 of the inlet part 1 of the filter is in a suitable way sealingly attached to the end of a reducing socket 12, e.g. by being folded around the end of the reducing socket 12 and attached by a mounting belt 5.

The filter device 1,2,3 acts as a throttling means in the ventilation duct 10 and the pipe socket 11 when air is sucked into the ventilation duct, and by the pressure drop over the walls of the filter the tubular walls 1,2 of the filter will be sucked into and centered in the position shown in Fig.2 in the ventilation duct 10 and the pipe socket 11. A lattice gate (not shown) may be positioned over the opening 4 in the usual way.

The filter device may also have the shape shown in Fig.3 comprising an inlet part 1 and two opposite, lateral outlet parts 2 with closed ends 4. Such a filter device is intended for insertion

into a ventilation duct 10 with a lateral inlet pipe socket 11, as shown in Fig.4. If the filter material at least at the open end part 4 of the inlet part 1 is elastic it may be folded back over the end part of the pipe socket 11 and secured by a mounting belt. As an alternative the open end part 4 of the inlet part 1 may be provided with a sleeve with an enlarged part fitting the end part of the pipe socket.

An inlet pipe socket may be positioned at other locations along a ventilation duct, e.g. at an elbow. In that case the filter device will have the shape shown in Fig.5 with an inlet part 1 and two outlet parts 2 with closed ends 3 and mutually forming an angle. Also a third outlet part with a closed end is possible forming an extension of the outlet parts 2 shown in Fig.5 if the filter device is intended for insertion into a corresponding edge portion of a ventilation duct system.

The invention is of course not limited to the embodiments shown and described here, but can be modified in different ways within the scope of the inventive idea defined by the claims. This is valid a.o. in case of special designs of the ventilation ducts in which case shape and diameters or areas of inlet and outlet parts of the filter devices must be adapted to shape and diameters or areas of ventilation ducts as well as pipe sockets.

C L A I M S

1. A filter device of tubular bag type for mounting within short inlet pipe sockets (11) to ventilation ducts (10), **characterized** in that an open ended inlet part (1) of the filter device is provided with a means for sealingly attaching a portion (4) of said open ended inlet part (1) to the wall of said pipe socket and has an extension corresponding to the length of said pipe socket and is shaped with an extension in the shape of at least one laterally curved, elongated outlet part (2) with closed end (3).

2. A filter device as claimed in claim 1, **characterized** in that the filter device has a less diameter than the ventilation ducts (10) and the pipe socket (11) and with the open ended part (4) is mounted connected to a reducing socket (12), which is attached to the end part of the inlet pipe socket (11).

3. A filter device as claimed in claim 1, **characterized** in that the filter device has a less diameter than the ventilation ducts (10) and the pipe socket (11) and consists of extensible material, the open end portion (4) of which is extensible for attaching to the wall of the pipe socket (11), preferably by folding back over the end portion of the pipe socket.

4. A filter device as claimed in any of claims 1-3, **characterized** in that the inlet part (1) of the filter device is provided with a an extension comprising two in opposite directions bowed, elongated outlet parts (2) with closed ends (3).

Fig. 1

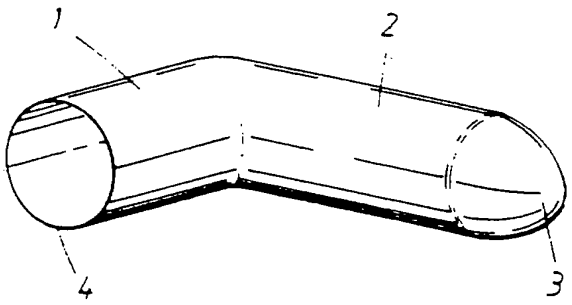


Fig. 2

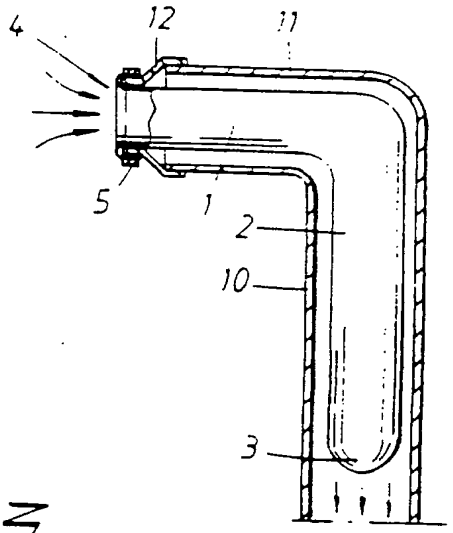


Fig. 3

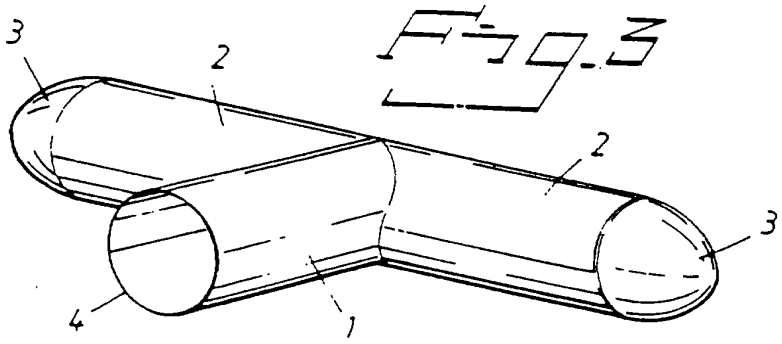


Fig. 5

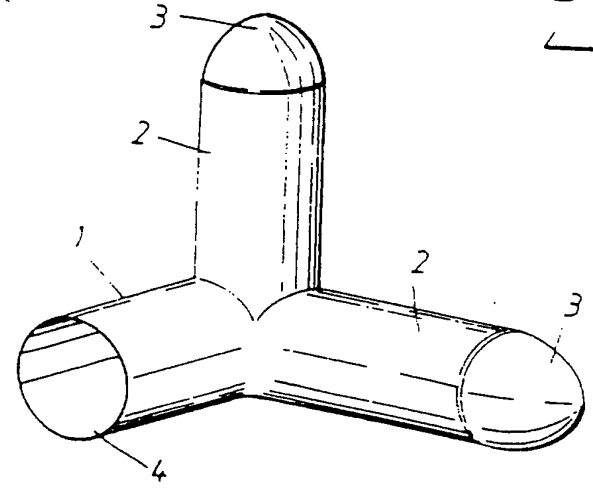
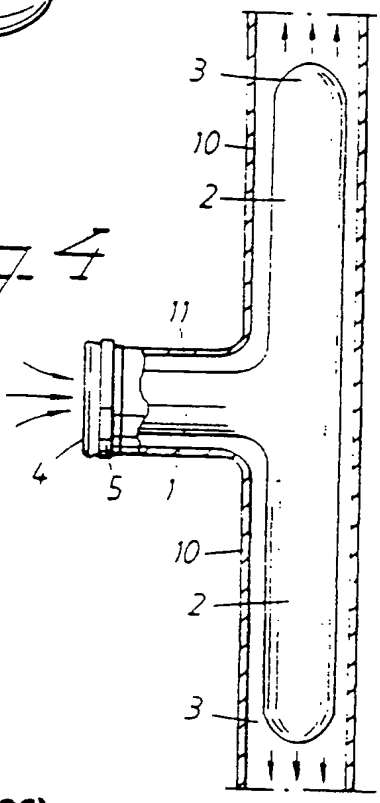


Fig. 4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 96/00160

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B01D 46/02
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: B01D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SE 434466 B (KEMFILTER I SÖDERHAMN AB), 30 July 1984 (30.07.84), page 1, line 20 - line 39; page 2, line 1 - line 4, figures 3,4, claim 1, abstract -- --------	1-4

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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29 May 1996	30 -05- 1996
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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International application No.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
SE-B- 434466	30/07/84	SE-A- 8200764	11/08/83